

REMARKS

At the time of the final Office Action dated May 13, 2009, claims 1, 3, 4, 6-13, 15, 16, and 18-22 were pending in this application. In this Amendment, claims 1 and 13 have been amended, and claims 7, 8, 18, and 19 have been cancelled. Care has been exercised to avoid the introduction of new matter. Support for the amendments to claims 1 and 13 can be found in, for example, claims 7 and 18, and the paragraph bridging pages 22-23 of the specification.

Claims 1, 3, 4, 6, 9-13, 15, 16, and 20-22 are now active in this application, of which claims 1 and 13 are independent.

Claim Rejections—35 U.S.C. § 103

1. Claims 1, 3, 4, 6-11, 13, 15, 16, and 18-21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata et al. (U.S. Patent Application Publication No. 2001/0008295, hereinafter “Sakata”) in view of Kloppel et al. (U.S. Patent Application Publication No. 2003/0170449, hereinafter “Kloppel”) and Kataoka et al. (U.S. Patent No. 6,133,522, hereinafter “Kataoka”), and further in view of Minoru (JP 2002-305212).

Applicants respectfully traverse this rejection because Sakata, Kloppel, Kataoka, and Minoru, individually or in combination, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claims 1 and 13.

With respect to independent claim 1, the applied combination of the references does not teach, among other things, the following limitations as recited in the claim:

a paste electrode formed on the transparent oxide film, wherein the paste electrode contains at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin; and

an electric wire connected to the paste electrode by solder, and

wherein ... said transparent conductive oxide film contains SnO₂- added In₂O₃,
and

the content of Sn in said transparent conductive oxide film is not more than 2 percent by weight.

First, Kloppel does not teach “the content of Sn in said transparent conductive oxide film is not more than 2 percent by weight,” as claimed. The Examiner asserted in relation to claims 8 and 19 that “Kloppel et al. teach the content of indium oxide in the ITO is 90% and that of the tin oxide is 10% (See paragraphs 000840027)” and “[i]t was found that the content of Sn in the transparent conductive oxide film is about 5% by weight” (the first full paragraph on page 6 of the Office Action).

Even if the Examiner's above assertion is assumed proper for the sake of this response, it is apparent that the applied combination of the references does not teach, among other things, “the content of Sn in said transparent conductive oxide film is not more than 2 percent by weight,” as claimed.

Second, Minoru does not teach “the paste electrode contains at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin,” as claimed. The Examiner asserted by referring to paragraph [0011] and claim 2 of Minoru that “[i]t is known that a silver conductive paste containing about 60-80% by weight of epoxy resin (or weight ratio of epoxy to urethane is between 10:2 to 5-10:5) in the blending of epoxy and urethane resin (See Minoru, paragraph 0011 and claim 2)” (paragraph bridging pages 3 and 4 of the Office Action).

Semiconductor mounting paste of Minoru is used as an adhesive (see paragraph [0001]). Even if the combination of the references is assumed proper, the teaching of Minoru simply replaces the claimed solder for connecting the electric wire and the paste electrode. Minoru does not teach the composition of the claimed paste electrode.

In addition, as described in, for example, paragraph [0002] of Minoru, semiconductor mounting paste is used for bonding a semiconductor chip to a substrate (e.g. alumina substrate or

organic substrate). Therefore, the bonding target of the semiconductor mounting paste of Minoru is different from that of the claimed paste electrode bonded to the transparent conductive oxide film. A bonding material needs to have a composition tailored to characteristics (e.g. quality of material) of the bonding target. Even if it is assumed that Minoru discloses a paste containing at least about 67 percent by weight and not more than about 80 percent by weight of epoxy resin for bonding a semiconductor chip to a substrate, persons skilled in the art would not be motivated to apply the composition of Minoru's paste to the composition of the paste electrode used for bonding the transparent conductive oxide film (which is not a semiconductor chip) and a substrate.

In claim 1, adhesiveness can be improved between the transparent conductive oxide film and the paste electrode because "the paste electrode contains at least about 60 percent by weight and not more than about 80 percent by weight of epoxy resin," "the transparent conductive oxide film has an arithmetic mean deviation of the profile of not more than about 2 nm" and "a surface of the transparent conductive oxide film has irregularities with a height." The applied combination of the references does not teach such a benefit obtained from the claimed subject matter.

Accordingly, Kloppel and Minoru do not cure the deficiencies of the combination of Sakata and Kataoka.

Based on the foraging, Sakata, Kloppel, Kataoka, and Minoru, individually or in combination, do not disclose or suggest a photovoltaic device including all the limitations recited in independent claim 1. Dependent claims 3-6 and 9-11 are also patentably distinguishable over Sakata, Kloppel, Kataoka, and Minoru at least because these claims include all the limitations recited in independent claim 1.

The above discussion is applicable to independent claim 13 at least because the claim include limitations similar to the above-discussed limitations of claim 1. Dependent claims 15, 16, 20, and 21 are also patentably distinguishable over Sakata, Kloppel, Kataoka, and Minoru at least because these claims include all the limitations recited in independent claim 13.

Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

2. Claims 12 and 22 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Sakata in view of Kloppel, Kataoka and Minoru, and further in view of Morizane et al. (U.S. Patent Application Publication No. 2001/0045505, hereinafter "Morizane").

Claims 12 and 22 depend on independent claims 1 and 13, respectively. Applicants thus incorporate herein the arguments made in response to the rejection of independent claims under 35 U.S.C. § 103(a) for obviousness as predicated upon Sakata, Kloppel, Kataoka, and Minoru. The Examiner's additional comments and reference to Morizane do not cure the deficiencies of the applied combination of Sakata, Kloppel, Kataoka, and Minoru because Morizane does not teach the limitations recited in independent claims 1 and 13. Applicants, therefore, respectfully solicit withdrawal of the rejection of the claims and favorable consideration thereof.

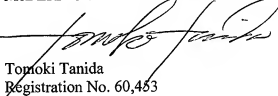
Conclusion

Accordingly, it is urged that the application is in condition for allowance, an indication of which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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